

NOTES ON *CICADAS*.

BY WALTER W. FROGGATT.

Regularly every season as the warm summer days set in, toward the latter part of the year, the shrill call of the Cicadas, or "locusts" as they are popularly called, is heard with monotonous regularity in every cluster of trees or shrubs about Sydney. It is noticeable that every third year they appear in much greater numbers than in the two preceding seasons; and with the well known fact before us that the American "Seventeen-year Cicada" (*C. septemdecim*) reappears every seventeenth year, I am led to the conclusion that several of our larger species take three years to reach maturity.

During this last season (1894-5) they appeared in countless numbers all round the neighbourhood of Sydney, and were much more in evidence about the suburbs than they had been for many years previously. The paddocks about Croydon were literally covered with the tubular holes through which the pupæ had escaped, while every tree trunk and fence was festooned with the dry larval skins split down the middle of the back and firmly fixed in position by the powerful claws of the fore legs. For fully three months they kept up one continuous screech, unless a thunder storm sprang up, and then every Cicada was mute. Acting on a suggestion made by Dr. Cox at one of our meetings some time ago [Proceedings iii. (2), p. 1508], I jotted down a number of observations made in the bush under these very favourable circumstances, of which the following notes are the result.

At Croydon the first Cicada was heard on the 30th of October about sunset, and a few days later I caught several of the small black ones (*Melampsalta melanopygia*, Ger.). In February their dead bodies began to be plentiful under the trees, and the calls of the survivors were fitful and irregular, according to the state of the weather, being heard only on fine days. The last heard at

Croydon were calling upon the 14th of March, but a single one was recorded from Rose Bay on the 29th of the same month.

In "Insect Life," [Vol. iv. (1892), p. 248], Riley gives an account of the "digger wasp," *Sphex speciosus*, which stores its nest with one of the common American Cicadas. As I had heard that wasps had been seen killing Cicadas here, I kept a look out for them. During the height of the "locust season" I frequently saw the large yellow sand wasp, *Priocnemus bicolor*, Smith, hunting over the stems of the trees frequented by the Cicadas, which generally flew away with a great clatter without my being able to see what had happened. Eventually I saw the whole business; a hornet flew up, caught by the leg a Cicada engaged in sucking up sap, and shook it until it withdrew its style and flew away. The hornet then stood over the spot and eagerly sipped up the sap as it exuded from the puncture made by the Cicada's style. I afterwards saw the same performance on several occasions, the hornet apparently never hurting the Cicada.

As a general rule the Cicadas prefer the trunks and stout branches to the young twigs and foliage, for with their long and powerful sucking mouth they can perforate the bark and obtain a plentiful supply of nourishment where the flow of sap is most abundant.

Several accounts have been recently published about the curious miniature cities built by the pupæ of some of the American Cicadas. The pupæ (for some reason as yet unsatisfactorily explained) come up to the surface before they are ready to emerge, and form a hollow dome of clay of from two to four inches in height above their tubular shaft about a foot in depth; to the bottom of this they again retreat, after adding this superstructure, until they are ready to cast their pupal garments.

Very little is known about the habits of the larvæ and pupæ of any of our species, most of them coming straight up from a considerable distance below the surface when ready to emerge; but I have upon several occasions found a single pupa under stones; such were always enclosed in a stout clay cell at the base of which was a small reservoir of water.

I am indebted to Mr. W. F. Kirby, of the British Museum, for the identification of most of my species.

THOPHA SACCATA, Amyot ("The Double Drummer").

This is our largest species, measuring $5\frac{1}{2}$ inches across the wings from tip to tip; the body $9\frac{1}{2}$ lines across the shoulders, and lower down upon the large males at the drums an inch; the abdomen short and rounded in the males, and coming to a sharp point in the females. Wings hyaline and unspotted, the nervures pinkish-brown with the costal lower one marked with black. General colour fulvus-brown, with the centre of the thorax marked with transverse angular black stripes, and the basal part of all the the abdominal segments also black.

From the way in which his musical apparatus projects this Cicada is called the "Double Drummer" by the Sydney boys; and the female without this development is called the "Single Drummer." This species attracts one's notice in the middle of November; and increases in numbers until the middle of January. They were not so common about the gardens, but on North Shore and about Manly seemed to prefer the clumps of small stunted gums (*E. corymbosa*, *E. robusta*, and *E. resinifera*), clinging to the stems, and flying off at the least sound. Their cry is a loud harsh note drawn out and shrill; when singing they do not move their bodies, but droop their wings down on either side.

CYCLOCHILA AUSTRALASIE, Amyot ("The Green Monday").

Expanse of wings 5 inches, width across the shoulders 9 lines, length of body 3 inches. Wings hyaline, unspotted; nervures bright green, the base of the large nervures near the shoulder yellow tinted with carmine. The whole of the insect pale grass-green, but changing to a much duller colour after death.

This is our commonest Sydney Cicada, which is found in greater or less numbers every season. The first was taken about the 3rd of November, and by the 13th all the trees in the gardens were covered with them; where there were no Eucalypts, they showed a

marked preference for the *Pittosporum* trees. Though I caught numbers, I could obtain no females until the 24th of November, three weeks after the first males appeared, but after that date they were nearly as plentiful as the other sex.

There is a yellow variety of this species, which is popularly called the "Yellow Monday;" the only difference that I can find is in the colour, but they are nothing like as common as the green one.

MACROUISTRIA ANGULARIS, Germ. ("The Union Jack").

Expanse of wings 5 inches, width of shoulders 9 lines, length of body $1\frac{3}{4}$ inches. Wings hyaline, the nervures pale ochreous-yellow, close to the shoulders reddish-brown, the nervures forming the lower marginal cells of the hind wings with a fine pencilled line of black on both sides, giving the wings a slightly mottled appearance. General colour of the insect black, with the front of the head, mesothoracic band, and the apex of the metathorax dark ferruginous; three patches in a line between the eyes with another behind them, a row of three elongate spots in the centre of the prothorax, and a row of four slender transverse spots along the middle of the metathorax pale ochreous-yellow; colour of the ventral surface ferruginous mottled with black; in the males the drums are rather small and do not project on the sides.

This Cicada does not appear about Sydney every year, but during this last season it was comparatively numerous; it is never found about the gardens, but I found it more numerous where the smooth-stemmed gums (*Eucalyptus sieberiana* and *E. haemastoma*) were common, generally upon the main trunk.

PSALTODA MGERENS, Germ. ("The Floury Miller").

Expanse of wings $4\frac{1}{2}$ inches, width of shoulders 8 lines, length of body $1\frac{1}{2}$ inches. Wings hyaline, nervures of the fore wings black, with the edges of several forming a W near the tip of the fore wing, and those forming the apex and sides of the lower row of cells edged on either side with black, giving them a thickened

appearance; the nervures of the hind wings horn-brown, with the apex of the lower row of cells towards the tip deeply shaded with black, fading out towards the middle of the wing.

The whole of the insect is black on the upper surface, but covered with fine silvery white hairs which form little white spots here and there, looking as though it had been dusted with flour. From this circumstance it has received from the Sydney children the rather appropriate name of the "Floury Miller."

None of this species were seen about Sydney until the commencement of December. They are rarely found in gardens, preferring the Eucalypts; at Manly on the 7th of December they were very numerous upon the smooth stems of the apple tree gums (*Angophora lanceolata*); upon one small limb not more than a foot in diameter I counted 49, and all the trees in the gully were covered with them.

When singing they sit close against the stem, elevating the tip of the abdomen and jerking it up and down while the song continues; their note is sharp and shrill, but more musical than any of the other species. When sucking up the sap they flatten the body against the branch, burying the rostrum right up to the head, it being long enough to penetrate the stout bark and reach the inner side. They remained in considerable numbers until early in January, when they began to be scarce.

PSALTODA FLAVESCENS, Dist. ("The Mottled Grey").

Expanse of wings $4\frac{1}{2}$ inches, width across the shoulders 7 lines, length of body 16 lines. Wings hyaline, nervures brown, but mottled with black, which extends over on either side, forming three irregular bands across the wings, the nervures of the hind wings brown. Ground colour of this Cicada black, thickly mottled with chocolate brown and ferruginous red, the former forming a slender parallel bar across the centre and a band along the apical margin of the prothorax, a W-like mark in the centre, a stripe on the sides of the mesothorax, and the edges of the metathorax and scutellum pale brown, the ferruginous tints

mottling the head and thorax and marbling the segments of the abdomen, the head behind the eyes and the abdomen frosted with silvery pubescence; ventral surface grey except the abdomen which is black, and the covers of the drums which are reddish-pink, flat and placed behind the hind legs.

I am told by some of my young friends that this is called the "Mottled Grey," but do not think that the name is in general use. I had never seen more than half-a-dozen specimens of this species until last year, when they appeared in considerable numbers, but chiefly in the neighbourhood of Hurstville and Sutherland; a few were taken about Middle Harbour and others at Granville.

MELAMPSALTA MELANOPYGIA, Germ.

Expanse of wings 2 inches, width across the shoulders 3 lines, length of body 10 lines. Wings hyaline, costal nervure of both wings and the two inner nervures of the hind ones yellowish-brown edged with black on both sides, all the others black. Head and thorax chestnut brown mottled with black and clothed with fine white hairs scattered over the dorsal surface, but much closer upon the legs and undersurface; legs chestnut striped with black, the scutellum small, forming four angular star-like ribs, the abdomen at the base and along the summit black, the sides, tip and undersurface golden yellow, lightly clothed with fine hairs.

This is the first Cicada to appear about Sydney, the earliest specimens being taken on the last day of October at Hornsby. They are very active little fellows, flying about and clinging to the stems of the young Eucalypts, calling with a sharp whirring note all the time. I have taken a few of these every season about Hornsby and Middle Harbour, but they do not last long, disappearing in a few weeks.

MELAMPSALTA ENCAUSTICA, Germ.

Expanse of wing $1\frac{3}{4}$ inches, width across the shoulders 3 lines, length of body 8 lines. Wings slightly opaque, all the larger nervures brown lined on either side with black, all the smaller

ones black. Head and thorax black, with a spot behind the ocelli, a parallel line down the centre of the prothorax, and two similar ones crossing the mesothorax light brown; the ridges of the scutellum of a similar colour but tinged with pink, with several other pink marks above the antennæ and sides of the thorax; abdominal segments black, with a narrow apical transverse band of pale yellow, extending right round, the tip bright yellow; legs variegated with black and white, striped with pinkish-yellow.

This is one of our smallest species, seeming to take the place of the preceding species in the Shoalhaven district.

Three other fine species not yet determined were also taken, but as far as I know are very rare, only a pair of each having been found during the last three seasons.

TIBICINA sp. A handsome dark chestnut-brown insect measuring $3\frac{1}{2}$ inches across the wings, with two black spots towards the tips of the forewings, and the sides of the thorax and abdomen clothed with fine white hairs, very thick upon the latter, the costal nervure of the forewings also mottled with similar pubescence.

PSALTODA sp. A large black Cicada with an expanse of 4 inches across the wings, the nervures being tinted with reddish-brown; the male has a large patch of bright golden hairs on the sides of the third segment of the abdomen, absent in the female.

PSALTODA sp. A slightly smaller insect, similar in general colouration, but the blotch upon the side of the abdomen of a bright silvery colour.